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Brief screening for psychosis-like experiences

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ABSTRACT

Objective: Psychotic-like experiences (PLEs) are common, and are markers of poor mental health. This study examined the internal structure of a screening test, the Community Assessment of Psychic Experiences-Positive scale (CAPE-P) in a young Australian sample.
Method: A cross-sectional online survey, which included the CAPE-P, was completed by 1610 university students aged between 18 and 25 years. Confirmatory factor analyses compared 1-, 4-, and 5-factor models, and examined effects of omitting selected items.
Results: A 3-factor model, omitting items on magical thinking, grandiosity, paranormal beliefs and a cross-loading item produced the best fit. The resultant 15-item CAPE (CAPE-P15) had three subscales - Persecutory Ideation, Perceptual Abnormalities and Bizarre Experiences, all with high levels of internal consistency.
Conclusion: The CAPE-P15 shows promise as a measure of positive, psychosis-like experiences, but further validation of this measure is required in community samples.

1. Introduction

Psychotic-like experiences (PLEs) are subclinical delusional ideas and perceptual disturbances that lie on a phenotypic continuum with psychotic symptoms and disorders. They are much more common than psychotic disorders, with 12-month prevalence rates of 15 to 28% in community samples of adolescents and young adults (Scott et al., 2008; van Os et al., 2009; Kelleher and Cannon, 2011). PLEs have been associated with an increased risk of developing future psychotic disorder (Bak et al., 2003; Hanssen et al., 2005), as well as being associated with a broad range of common mental health problems, including anxiety, depression, substance misuse, suicide risk and self-harm (van Os et al., 2002; Hides et al., 2009; Saha et al., 2011a, 2011b).

Given the high burden of illness associated with PLEs, there is growing demand for accurate screening of PLEs, as a timely identification of people experiencing them may provide an opportunity for preventive interventions (Saha et al., 2011a; Kelleher et al., 2012). The Community Assessment of Psychic Experiences (CAPE) has been advanced as a potential screening instrument (Stefanis et al., 2002; Yung et al., 2006; Brenner et al., 2007; Armando et al., 2010). The CAPE in fact measures what we now know as PLEs in spite of the use of the word psychic in its title. The full 42-item CAPE has three subscales, assessing positive, depressive and negative symptoms, and demonstrates satisfactory reliability, construct and discriminant validity (Stefanis et al., 2002). However, it is the 20-item positive scale (CAPE-P) that most strongly predicts later psychosis (Welham et al., 2008). Its brevity and predictive power for adverse mental health outcomes resulted in it becoming a widely used measure of positive PLEs (Brenner et al., 2007; Yung et al., 2009).

While the CAPE-P has high internal reliability (alpha = .82) (Brenner et al., 2007), recent studies suggest that it comprises 4–5 subscales (Verdoux et al., 2003; Stefanis et al., 2004; Yung et al., 2009; Armando et al., 2010; Wigman et al., 2011). In exploratory analyses, Stefanis et al. (2004) identified 4 principal components in a sample of 3500 19-year-olds (Paranoia, First Rank Symptoms, Hallucinations, Grandiosity). Yung et al. (2009) obtained almost identical factors in 875 senior high school students (relabelled Persecutory Ideas, Bizarre Experiences, Perceptual Abnormalities, Magical Thinking), with only two items changing placement. Armando et al. (2010) confirmed the factor structure in 1882 high school and university students, using principal axis factoring, but omitted two questions from Magical Thinking, which they re-labelled as Grandiosity. Exploratory and confirmatory factor analyses by Wigman et al. (2011), using samples of 5422 and 2230 high school students, split the final factor in two (Grandiosity and Paranormal beliefs), each with only two items. A recurring problem with Magical Thinking/Grandiosity is that experiences relating to voodoo, occult and magical thinking are common and are not reliably associated with psychopathology, either cross-sectionally or longitudinally (Berenbaum et al., 2009).

Overall, there is substantial stability in the internal structure of the CAPE-P, with the exception of the factor/s relating to Magical Thinking or Grandiosity. In addition, the first three factors show consistent relationships with distress or depression and poor functioning, whereas

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the fourth is less strongly associated with morbidity (Yung et al., 2009; Armando et al., 2010).

The current study aimed to refine the CAPE-P using confirmatory factor analyses to identify its optimal internal structure in a large sample of young people. The relative model fit with and without items relating to Magical Thinking was a particular focus.

2. Materials and methods

2.1. Participants

A cross-sectional sample was obtained from students at Queensland University of Technology (QUT), Brisbane, Australia. Participants were aged between 18 and 25 years, had the ability to read and understand English and had no history of treated psychotic disorder.

2.2. Measures

The CAPE Positive scale (CAPE-P) is a 20-item self-report measure of experiences that are similar to positive psychotic symptoms, but may not fully meet diagnostic criteria. Examples of items include "*Have you ever seen objects, people or animals that other people can't see*?" and "*Have you ever felt as if there is a conspiracy against you*?. Responses to items range from 0—never, through sometimes and often, to 4—nearly always. In the current study, questions about the distress caused by each specific experience were not included. Instead, after completing frequency ratings on all 20 items, participants were asked: "Overall, how distressed are these experiences making you feel?" (with responses of 0—not distressed, 1—a bit distressed, 2—quite distressed, 3—very distressed). They also rated distress on a 0–100 visual analogue scale with 0—no distress to 100—extremely distressed and disabled.

Assessments of familial mental health history, distress, suicidal ideation and behaviours and substance use were also obtained.

2.3. Procedure

Ethical approval from the QUT Human Research and Ethics Committee was obtained. Participants were recruited via student email requesting participation in an online survey of 'odd or unusual thoughts and experiences'. The email contained a link to the online survey and young people were offered the chance to go in a random draw for an ipad2© as an incentive to participate. Online consent provided access to the survey from June 2011 to June 2012.

2.4. Statistical analyses

Data were analysed employing the SPSS Version 19© and AMOS 19. Data was initially screened for missing items: Only complete cases were included in the analyses. Confirmatory factor analyses compared a single factor model, with a 4-factor and 5-factor model. Potential improvements of fit based on removal of some items were then examined. Good fit was indicated by a Root Mean Squared Error of Approximation (RMSEA) < .05 and other fit indices > .90.

3. Results

3.1. Sample characteristics

A total of 1610 participants completed the survey (90% of consenting participants). Their mean age was 22.1 (SD 5.1) years, 76% (1223) were female, and 52% (837) were single. Nearly all (1549, 99%) had completed high school or 12 years of education. Almost half (741, 46%) reported a family history of mental disorder, 8% (129) said there was a family history of psychosis, and 18% (284) said that a family member had been prescribed antipsychotic medication. A third of the sample (498, 32%) reported lifetime suicidal ideation and 7% (117) reported a previous attempt, with 1.5% (23) saying they made an attempt in the previous 30 days. Most (1236, 78%) had an alcoholic drink in the previous 30 days, and 22% (345) had more than 5 drinks on more than 5 days. Past cannabis use was common (41%, 643), but only 14% (127) had used cannabis in the previous 30 days.

3.2. Confirmatory factor analysis of the CAPE

Both the 4- and 5-factor models performed significantly better than the single-factor model (Table 1). The 4-factor models did not fit the data as well as the 5-factor model of Wigman et al. (2011).

Questions on magical thinking, grandiosity and paranormal beliefs were removed, and the factor structure was re-examined. The most robust model also omitted the question, "*Have you ever felt that things in magazines or on TV were written especially for you*?" which was very commonly endorsed (46% ≥ sometimes), and which cross-loaded on Perceptual Abnormalities and Persecutory Ideation. The optimal model comprised three factors (Paranoid Ideation, Bizarre Experiences, Perceptual Abnormalities). As shown in Table 1, this model showed excellent fit (RMSEA = .027, CFI = .976, NFI = .927, RFI = .914, IFI = .948, TLI = .938).

The resultant scale (CAPE-P15) is displayed in Fig. 1 and Table 2. The total CAPE15 had high internal consistency ($\alpha = 0.79$; Corrected item-total correlations ranged .35-.49). While the brevity of the subscales constrained their alpha coefficients, their corrected item-total correlations were all > .30 (Persecutory Ideation: .68, .39-.47; Perceptual Abnormalities .66, .43-.58; Bizarre Experiences .69, .35-.49).

4. Discussion

Our observation that the best fit was obtained by a 3-factor model on 15 items was consistent with previous research showing a robust factorial structure for CAPE-P, apart from items on magical thinking/grandiosity subscales (Yung et al., 2009; Armando et al., 2010; Wigman et al., 2011). The obtained factors are also the most robust ones in previous research, and the factors that have demonstrated closest associations with distress and functional impact (Yung et al., 2009; Armando et al., 2010; Wigman et al., 2011). In previous research, distress, depression and poorer functioning were strongly associated with the Bizarre Experiences (BE), Persecutory Ideas (PI) and Perceptual Abnormalities (PA) subscales, whereas the remaining subscale (magical thinking/grandiosity/paranormal beliefs) was not consistently associated with poor mental health (Yung et al., 2009; Armando et al., 2010; Wigman et al., 2011). Wigman et al. (2011) suggested their 5-factor

Table 1
Results of confirmatory factor analyses on the CAPE-P.

	RMSEA	CFI	NFI	RFI	IFI	TLI
Single scale, 20 questions	.078	.721	.702	.667	.722	.688
Four subscales, 20 questions (as per Yung et al., 2009)	.053	.875	.852	.829	.875	.855
Four subscales, 18 questions (as per Armando et al., 2010)	.045	.920	.898	.879	.920	.905
Five subscales, 20 questions (as per Wigman et al., 2011)	.037	.941	.917	.901	.941	.930
Further model development						
Three subscales, 16 questions, omitting Grandiosity, Paranormal beliefs[1]	.028	.973	.954	.940	.973	.965
Three subscales, 15 questions (CAPE-P15)[1,2]	.027	.976	.958	.947	.977	.970

[1]Allowed intercorrelations between error terms for CAPE-P items 1/3, 1/5, 5/12, 18/20.
[2]Omitted "*Have you ever felt that things in magazines or on TV were written especially for you*," because of cross loading on perceptual abnormalities and persecutory ideation.
RMSEA = root mean square error of approximation; CFI = comparative fit index; NFI = normed-fit index; RFI = relative fit index; IFI = incremental fit index; TLI = Tucker–Lewis index.